

## COMBINATION FUEL CELL AND ION PUMP, AND METHODS AND INFRASTRUCTURE SYSTEMS EMPLOYING SAME

### ABSTRACT OF THE DISCLOSURE

A combination fuel cell and hydrogen or oxygen pump includes an electrochemical cell comprising an anode inlet for receiving fuel, an anode outlet for exhausting fuel, a cathode inlet for receiving oxidant, a cathode outlet for exhausting oxidant, and first and second electrical connectors. A controller is operable for applying an electrical load to the electrochemical cell for generating electricity, and for applying an electrical potential to the electrochemical cell for purifying hydrogen or purifying oxygen. Methods and infrastructure systems are also disclosed.